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EXAMINER

GREENE, DANIEL LAWSON

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 09/01/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/661,847

Applicant(s)

BOARDMAN ET AL.

Examiner

Daniel L. Greene Jr.

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2005.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10, 11, 13 and 15-20 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-8, 10, 11, 13 and 15-20 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 16 November 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 6/17/2005 has been entered.

### ***Election/Restrictions***

2. Applicant's election without traverse of Group I, and the cancellation of claims 9, 12, and 14 in the reply filed on 6/17/2005 is acknowledged.

3. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

This restriction requirement is made FINAL.

### ***Drawings***

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "164" and "150" have both been used to designate core support beams. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the

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application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. **Therefore the following features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered:**

a. at least one groove mating with one of said plurality of support beams. The figures do not show the support plate mating with support beams, per se. The specification discloses the support plates mating with grooves or protrusion on said support beams. Item 142 is allegedly an opening, however Figure 2 clearly shows no such opening. Without an opening for the support beam to enter into the groove, it is not appear the support plate can actually mate with the support beam at all.

b. the protrusion extending along a length of said plurality of support beams (see claim 5) ,

Applicant's drawings received 11/16/2004 introduce new matter. There is no basis for label 164 to indicate where it does, and only where it does,

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nor does it specifically show mating grooves or protrusions, it appears to simply indicate item 150, the support beam.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

6. The amendment filed 11/16/2004 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is

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as follows: protrusions 164. Originally paragraph 0026 stated mating grooves or protrusions (not shown) machined into the core support beams. Applicant's 11/16/2004 amendment introduced the new matter

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. **Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement.** The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant's own admission in paragraph 0026 lines 3-6 state that the specification fails to disclose how and in what manner the support beams comprise a protrusion extending along a length thereof, because the protrusions are not shown.

8. **Claims 1-8, 10, 11, 13 and 15-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement.** The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

a. Regarding claims 1 and 13, there is no adequate description or enabling disclosure of how and in what manner the at least one removable support plate will function in the manner claimed, including the thickness of the plate, thickness of the groove, relationship between the two, how the groove actually mates with the support beam, etc. It appears that according to Figure 3 that the support plates will not be able to mate directly to the support beams because the four protrusions (142) on either side appear to be closed with no space for the plate to mate with a solid beam, in fact the specification discloses the plate mating with protrusions or grooves on the core support beams, not the support beams themselves, hence the disclosure is insufficient and non-enabling. Also see the discussion of this topic in section 5 above.

b. Regarding claim 4, there is no adequate description or enabling disclosure of how and in what manner said at least one removable support plate is configured to be removed from above the core. The limitation "is configured" implies an active method step of configuring, or altering, or modifying, however the specification fails to disclose exactly what is done

to “configure” the removable support plate in order for it to be removed from the core, hence the disclosure is insufficient and non-enabling.

c. Regarding claim 5, there is no adequate description or enabling disclosure of how and in what manner a protrusion extends along a length of each support beam, including how far, how many, how long, etc., hence the disclosure is insufficient and non-enabling. See the discussion of this topic in section 5 above.

**9. Claims 1-8, 10, 11, 13 and 15-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

a. Claims 1 and 13 are vague, indefinite and incomplete in what all is meant by and encompassed by the phrase “at least one groove mating with one of said plurality of support beams” (underlining added). The claim does not recite any positive limitations on the term “mating”, including how and in what manner such is accomplished, whether this refers to the use of the actual grooves, whether there is any play in the “mating” or whether it is a tight/secure fit. The claim does not recite whether the groove extends the whole length of the support beam or support plate, or only extends part length, etc., hence the metes and bounds of the claim are undefined. See the discussion of this topic in section 5 above.



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b. Claim 4 is vague, indefinite and incomplete in what all is meant by and encompassed by the phrase "is configured" since this reads on an active method step of configuring, hence the metes and bounds of the claim are undefined. See the discussion of this topic in section 8 above.

c. Claim 5 is vague, indefinite and incomplete in what all is meant by and encompassed by the phrase "a protrusion extending along a length thereof", hence the metes and bounds of the claim are undefined. See the discussion of this topic in section 5 above.

d. There is no proper antecedent basis for all terms present. See for example "a first channel" and "a second channel" in claim 19, etc.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**10. Claims 1-6, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,127,445 to Anthony for the reasons set forth in section 16 of the previous office action mailed 12/23/2004 as further explained in section 8 of said previous office action mailed 12/23/2004.**

It is noted that the support plates are indirectly mating with the support beams and in any event applicant's claim language does not preclude indirect contact, i.e. contact with a pin or pad, because the claim does not specifically disclose the support plate and support beam is in direct contact, therefore it is considered that the pins and posts are no different from, and read on, applicant's "protrusions" which extend into the groove.

**11. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,782,439 to Rinderer.**

Rinderer discloses an apparatus comprising:

a plurality of support beams (14); and

at least one removable support plate (12) disposed on said plurality of support beams (14), each said removable support plate comprising at least one groove (64) mating with one of said plurality of support beams in, for example, Figures 1-7, column 2 lines 27+, and column 3 lines 47+.

The recitation for supporting fuel assemblies in a reactor pressure vessel including a core has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951). Regardless Rinderer is inherently

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capable of use in supporting fuel assemblies in a reactor pressure vessel including a core.

As to limitations which are considered to be inherent in a reference, note the case law In re Ludtke, 169 USPQ 563, In re Swinehart, 169 USPQ 226, In re Fitzgerald, 205 USPQ 594, In re Best et al., 195 USPQ 430, and In re Brown, 173 USPQ 685,688.

Regarding claim 2, Rinderer is inherently capable of the intended use of a core support.

Please note that statements as to possible future acts or to what may happen in a method or operation, i.e. form a core support, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See In Re Pearson, 181 USPQ 641; In re Yanush, 177 USPQ 705; In re Finsterwalder, 168 USPQ 530; In re Casey, 152 USPQ 235; In re Otto, 136 USPQ 458; Ex parte Masham, 2 USPQ 2<sup>nd</sup> 1647.

See MPEP 2114 which states:

A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ 2<sup>nd</sup> 1647.

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. In re Danly, 120 USPQ 528, 531.

Apparatus claims cover what a device is, not what a device does. Hewlett-Packard Co. v. Bausch & Lomb Inc., 15 USPQ 2<sup>nd</sup> 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

Regarding claim 3, Rinderer inherently must have a support "ring" of some sort in order for it to function as claimed, otherwise it would have to lie on the floor, which would negate the purpose of the support system for transmission lines and cables. Interpreted in its broadest sense, a support "ring" reads on any structure surrounding the support grid, including the walls of the building that the support grid is within. It is noted the beams intersect one another at the support plate, see for example, figures 1 and 7.

Regarding claim 4, Rinderer is inherently capable of being removed from above the core because it is modular and put together with nuts and bolts that can be removed from above.

Claim 5 is further disclosed in, for example, Figure 9 wherein protrusion 80 is clearly extending along a length thereof and receivable in at least one groove.

Claim 6 is further disclosed in, for example, Figure 1 wherein it is understood that ribs 56 form a matrix wherein the open space between the ribs reads on flow passages.

**12. Claims 1-8, 10, 11, 13 and 15-18 are rejected under 35 U.S.C. 102(a) as being anticipated by U.S. Patent 6,813,327 to Challberg.**

Challberg discloses a nuclear reactor comprising:  
a reactor pressure vessel (10);

a reactor core (22) located inside said reactor pressure vessel (10);  
and an apparatus (50) for supporting fuel assemblies in a reactor pressure vessel including a core, said apparatus comprising:  
a plurality of support beams (60); and  
at least one removable support plate ((58), (82)) disposed on said plurality of support beams, each said removable support plate comprising at least one groove mating with one of said plurality of support beams wherein at least one groove reads on grooves in the surface of the plate created during the manufacturing and surface finishing process.

Claim 2 is clearly disclosed in, for example, Figure 1, wherein said at least one removable support plate and said plurality of support beams form a core support (58).

Claim 3 is clearly disclosed in, for example, Figures 1, 3, 7, 8 and 11, wherein it is clearly shown that the core plate assembly further comprises a support ring having an inner periphery and an outer periphery, said plurality of support beams extending between said inner periphery, said plurality of support beams intersecting one another to form a support beam matrix.

Claim 4 is clearly disclosed in, for example, Figure 1, wherein said at least one removable support plate is configured to be removed from above the core.

Claim 5 is further disclosed in, for example, Figure 5, wherein each of said plurality of support beams (96) comprise a protrusion (reads on the

upper most tapered portion of beam (96)) extending along a length thereof, said protrusion receivable within said at least one groove, wherein it is understood that the plate inherently has grooves from the manufacturing process that receive said protrusion when they are in intimate contact with each other after being assembled in the core.

Claims 6 and 15 are further disclosed in, for example, Figure 4, wherein said at least one removable support plate comprising at least one support plate flow passage (78).

Claims 7 and 16 are further disclosed in, for example, Figure 5, wherein said at least one removable support plate (82) comprising at least one removable support block (80) disposed thereon, said removable support block having at least one support block flow passage (88) in flow communication with one of said at least one support plate flow passage.

Claims 8 and 17 are further disclosed in, for example, Figure 5, wherein said removable support block (80) comprising at least one flow inlet portion extending from one side of said removable support block, said at least one flow inlet portion providing flow communication to one of said at least one support block flow passage, said at least one flow inlet portion receivable within one of said at least one support plate flow passage.

Claim 10 is further disclosed in, for example, Figure 4, wherein said support plate further comprises a guide tube opening (46), said guide tube opening comprising at least one cruciform shaped slot, said support plate further comprising a first groove, a second groove, a third groove and a

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fourth groove, said first, second, third and fourth grooves located in a bottom surface of said support plate and positioned around said guide tube opening wherein it is understood that grooves are present in the plate due to manufacturing processes.

Claim 11 is inherently disclosed wherein at least two of said first groove, second groove, third groove and fourth groove extend along said bottom surface substantially parallel to each other, and wherein one end of at least one of said first groove, second groove, third groove and fourth groove intersects with one end of at least one of said first groove, second groove, third groove and fourth groove because typical finishing methods and processes produce grooves in various patterns and relationships which read on the claimed limitation.

***Claim Rejections - 35 USC § 103***

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**14. Claims 1-8, 10, 11, 13 and 15-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,813,327 to Challberg in view of U.S. Patent 3,650,895 to Sodergard.**

Challberg discloses a nuclear reactor comprising:

a reactor pressure vessel (10);

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a reactor core (22) located inside said reactor pressure vessel (10);  
and an apparatus (50) for supporting fuel assemblies in a reactor pressure vessel including a core, said apparatus comprising:  
a plurality of support beams (60); and  
at least one removable support plate ((58), (82)) disposed on said plurality of support beams, each said removable support plate comprising at least one groove mating with one of said plurality of support beams, wherein at least one groove reads on grooves in the surface of the plate created during the manufacturing and surface finishing process.

While the support plate appears to be one integral plate, making separable is within the skill of one having ordinary skill in the art. See In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961). As applied here it would appear that if it were considered to be desirable for any reason to divide the support plate into smaller pieces (i.e., ease of installation (less weight, more clearance, etc.), ease of shipping smaller pieces, etc.), it would have been obvious to make the support plate into smaller individually separable pieces/plates for that purpose.

In this regard, Sodergard teaches, in for example, figures 1-3, column 1 lines 9-17, 20-25, 32-45, and column 2 lines 7-10, 59-67, it is old, well known and advantageous to divide the core support plate into separate blocks (8) for the benefits of, for example, repairing guide tubes without dismantling the entire core bottom, inspection access to the lower part of the pressure vessel, etc.



At the time of the invention, it would have been obvious to one of ordinary skill in the art to replace the core plate of Challberg with separate blocks, as taught by Sodergard, such that the grooves shown in, for example, Sodergard Figure 3, at the lower portion of the block (8), would align and therefore mate with the protrusion (upper portion of beam (96) in Figure 5 of Challberg) of the support grid, as taught to be old and advantageous by Sodergard.

**While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).**

Claim 2 is clearly disclosed in, for example, Figure 1, wherein said at least one removable support plate and said plurality of support beams form a core support (58).

Challberg further discloses claim 3 in, for example, Figures 1, 3, 7, 8 and 11, wherein it is clearly shown that the core plate assembly further comprises a support ring having an inner periphery and an outer periphery, said plurality of support beams extending between said inner periphery, said plurality of support beams intersecting one another to form a support beam matrix.

Claim 4 is clearly disclosed in, for example, Sodergard column 2 lines 38-43, wherein said at least one removable support plate is configured to be removed from above the core.

Claim 5 is further disclosed in, for example, Challberg, figure 5, wherein each of said plurality of support beams (96) comprise a protrusion (reads on the upper most tapered portion of beam (96)) extending along a length thereof, said protrusion receivable within said at least one groove, wherein it is understood that by placing Sodergard's blocks (8) on top of Challberg's support beam matrix such that the edges of the blocks line up with said beams, the protrusion on the top of beam (96) will obviously be received within the grooves on said blocks. See for example Sodergard figures 2 and 3.

Claims 6 and 15 are further disclosed in, for example, Sodergard Figure 3, wherein said at least one removable support plate (8) comprising at least one support plate flow passage (9).

Claims 7 and 16 are further disclosed in, for example, Challberg Figure 5, wherein said at least one removable support plate (82) comprising at least one removable support block (80) disposed thereon, said removable support block having at least one support block flow passage (88) in flow communication with one of said at least one support plate flow passage.

Claims 8 and 17 are further disclosed in, for example, Figure 5, wherein said removable support block (80) comprising at least one flow inlet portion extending from one side of said removable support block, said at least one flow inlet portion providing flow communication to one of said

at least one support block flow passage, said at least one flow inlet portion receivable within one of said at least one support plate flow passage.

Claim 10 is further disclosed in, for example, Sodergard Figure 2, wherein said support plate further comprises a guide tube opening (10), said guide tube opening comprising at least one cruciform shaped slot, said support plate further comprising a first groove, a second groove, a third groove and a fourth groove, said first, second, third and fourth grooves located in a bottom surface of said support plate and positioned around said guide tube opening wherein it is understood that the grooves are considered as reading on the depression of the lower corners of the support blocks and applicant's current claim language does not define over such.

Claim 11 is also disclosed in , for example, Sodergard Figure 3 wherein at least two of said first groove, second groove, third groove and fourth groove extend along said bottom surface substantially parallel to each other, and wherein one end of at least one of said first groove, second groove, third groove and fourth groove intersects with one end of at least one of said first groove, second groove, third groove and fourth groove because the grooves appear to be present on each of the four lower circumferential edge surfaces of each support block (8).

**15. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,813,327 to Challberg in view of U.S. Patent**

**3,650,895 to Sodergard as applied to claims 1-8, 10, 11, 13 and 15-20 above and further in view of U.S. Patent 5,519,746 to Dalke et al.**

Challberg as modified by Sodergard discloses applicant's invention as explained above, however Challberg as modified by Sodergard does not specifically disclose that at least one internal flow passage directs flow into a first channel and a second channel, said first and second channels located within said at least one removable support block and that said first channel has a first flow outlet and said second channel has a second flow outlet.

Dalke teaches it is old and advantageous to increase the size of BWR fuel bundles by utilizing a bundle support plate (140) (See, for example, Figures 1-10) comprising at least one internal flow passage directing flow into a first and second channel having first and second flow outlets (54), for the benefits of reducing the total number of control rod drive mechanisms and to reduce the amount of fuel handling and shuffling during refueling outages in, for example, column 1 lines 60+. Dalke also teaches that it is simpler to provide four (sub bundle/fuel assembly) inlet nozzles in the inter-bundle support plate and that each sub-bundle can be separately orificed in order to assure good thermal-hydraulic-nuclear stability in, for example, column 2 lines 47-51.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the inter-bundle support plate of Dalke in the core support design of Challberg as modified by Sodergard

for the benefits therein, as taught to be old and advantageous by Dalke.

(See also, for example, Dalke, Column 3, lines 5-15)

### ***Conclusion***

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Sidney, Steinkamp, Braun, Thorp, Small and Medium Power Reactors and Annex 3 all teach it is notoriously old and well known in the nuclear art to use support grids/pillars/columns/contoured I-beams, etc. for core support structures.
- Anderson teaches it is old and well known to for the lower support plate to utilize individual plates.
- Hirukawa, Hosoya and Carruth also teach applicants inventive concept applied in a different fashion.

17. Examiner's Note: Examiner has cited particular columns and line numbers in the references as applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone

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number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.


19. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can normally be reached, Mon-Fri 6:30am - 4:00pm, at telephone number (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

20. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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